



**Before the
Federal Communications Commission
Washington, DC 20554**

In the Matter of)	
)	
Applications for Consent to the)	
Transfer of Control of Licenses)	
)	
MediaOne Group, Inc.,)	CS Docket No. 99-251
Transferor,)	
)	
To)	
)	
AT&T Corp.,)	
Transferee.)	

EX PARTE REPLY DECLARATION OF ALBERT PARISIAN

1. My name is Albert Parisian. I am the Director of Business Development for Broadband Data Services for GTE Media Ventures. My responsibilities at GTE Media Ventures and qualifications for submitting this Reply Declaration are detailed in my opening Declaration, filed with the Commission on August 23, 1999. I have been asked to: (i) review the claims made by AT&T and MediaOne in their Reply Comments submitted to the Commission on September 17, 1999, concerning the technical and regulatory feasibility of enforcing open access conditions, and (ii) expand upon the points made in my opening Declaration. In particular, I have been asked to review the Declaration of Milo Medin ("Medin Declaration"), which is attached as Appendix K to AT&T/MediaOne's Reply Comments, and respond to his criticisms of my opening Declaration.

State of the Technical Debate Over Open Access Conditions

2. The Commission is undoubtedly familiar with the terms of the debate over the technical feasibility of open access. In numerous fora -- including meetings before members of the Commission staff -- Milo Medin and I have stated our positions on the relative ease of opening AT&T/MediaOne's cable system to competing ISPs. His Declaration is essentially a redux of this debate, a debate I believe has been resolved in favor of open access. Numerous firms, including GTE, have proven that open cable systems can readily support all of today's broadband applications. Likewise, standards for future services (such as multicasting) will be open and facilitate consumer choice only if established by cable providers *in cooperation* with ISPs, software writers, and application developers.

3. A fundamental tension runs throughout the Medin Declaration -- a tension that exposes AT&T/MediaOne's true intentions for the closed management of its cable system. On the one hand, the Medin Declaration asserts that AT&T/MediaOne would not be able to "establish proprietary network and software protocols." *Id.* ¶ 8. On the other hand, the Medin Declaration criticizes GTE's proposed open cable architecture because it would not "enable multicast sessions" -- a service the vast majority of cable modem providers do not yet offer. *Id.* ¶ 29. Medin concludes that the solution to this "deficiency" in GTE's proposed open access conditions is to allow AT&T/MediaOne to establish closed proprietary protocols governing multicasting. Medin has confessed that Excite@Home is pursuing such proprietary standards, explaining to the Commission staff that he has asked CMTS and cable modem manufacturers to make proprietary changes to support Excite@Home's preferred multicasting solution. After

the merger, AT&T/MediaOne's control over 90-plus percent of cable modem customers will guarantee that equipment manufacturers oblige this and other similar requests. There is thus no real dispute over whether AT&T/MediaOne will incorporate closed protocols into its system. Rational self interest, even without a proven anticompetitive intention, will lead AT&T/MediaOne inexorably in that direction.

4. Nor will it take long for anticompetitive effects to take hold. A combined AT&T/MediaOne would not need more than two years to entrench itself as the broadband market leader. Two years is more than enough time to make proprietary changes to customer hardware and fill customers' homes with equipment that does not work with any other provider's services. Likewise, because broadband application and software writing is in its nascency, developers will write to the standard that reaches the largest number of customers. To establish this industry standard, AT&T/MediaOne would not need to rewrite the entire programming language used to develop Internet content or enable streaming video. Rather, AT&T/MediaOne could simply develop its own proprietary security and compression algorithms -- standards application writers must follow to make their content work on AT&T/MediaOne's system.

5. Moreover, AT&T/MediaOne can build its network in such a way as to make *ex post* regulatory solutions far more costly and complex to implement. The Medin Declaration offers a perfect illustration of how this is already being done *today*. Medin complains that GTE's proposed open access architecture may require Excite@Home to move its caching servers "from the headend to the regional level." *Id.* ¶ 11. Much of the investment in cable plant upgrades will be made over the next two years, and if Excite@Home architects a completely

built-out network with caching servers situated at each headend, the cost and complexity of migrating those servers back to the regional router -- where other ISPs can economically interconnect -- will be extreme. Put simply, the more of its network AT&T/MediaOne is able to build on the customer-side of the regional router, the more network will need to be uprooted if open access conditions are ultimately imposed. Whatever the cost and complexity associated with that task now, it will be orders of magnitude greater when AT&T/MediaOne has completed building out its network and implemented its system of closed protocols.

Anticompetitive Assumptions Underlying the Medin Declaration

6. The Medin Declaration is premised on a number of unspoken assumptions that, if allowed to continue driving AT&T/MediaOne's network design, will prove extremely harmful to consumers. Specifically, the Medin Declaration is based on AT&T/MediaOne's belief that:

- The only business model that will successfully provide consumers cable-based broadband services is one in which AT&T/MediaOne builds a proprietary and private national network with centralized control over hardware, software, applications, service protocols, and content. This control, to be effective, must span from consumer relationships, to local and regional distribution, to national control over network management and partnership development.
- Cable modem networks cannot exist as independently managed local access networks, contrary to the network-of-networks architecture that currently typifies the Internet. Rather, packet and traffic management for cable modem networks is so different from any other network that it requires centralized, national control.
- Cable modem and CMTS technology will not successfully evolve unless one national company charts its developmental course.
- Consumers can only be guaranteed freedom of choice if proposed open access conditions immediately solve all of Excite@Home's anticipated national-scale problems and fully support the provision of future (even undeveloped) IP services.

- The efficiencies Excite@Home may gain through vertical control over consumers' entire broadband experience outweigh the continuing benefits from the open and independent evolution of the Internet.

7. With these assumptions in place, the Medin Declaration identifies numerous problems with GTE's open access conditions -- including possible customer interference, network integration, and network congestion problems. Notably, Medin never makes explicit that these problems are *not* unique to an open architecture, nor how AT&T/MediaOne intends to solve them with its closed system. This omission invariably supports one of two conclusions: the problems identified in the Medin Declaration are not endemic to open cable systems, or AT&T/MediaOne's intended fix is based on a closed and proprietary architecture.

Point-By-Point Refutation of the Medin Declaration

8. The Medin Declaration makes a range of claims against my opening Declaration, all of which are summed up by the assertion that I failed "to consider costly and time consuming re-architecting of the cable system architecture that would be required to implement" GTE's proposed open access conditions. *Id.* ¶ 3. For ease of reference, I will respond to these points in turn.

9. Paragraph 4 of the Medin Declaration asserts that GTE's Clearwater open access demonstration represents only a limited trial that "cannot present the full range of real world demands that broadband networks" face and does not provide "insights into whether [the] model is scalable." To understand why this claim is erroneous, it is necessary to distinguish between two types of "scalability" and two possible sources of "real world problems." The *first* issue

confronting any cable modem provider -- open or closed -- is managing the volume of customers and traffic on its network. When a cable provider is successful in generating customer orders for broadband access, it must manage the traffic created by those customers at the local, city, and regional levels, *regardless of whether these customers are sending packets to an affiliated or unaffiliated ISP*. Under GTE's proposed open access conditions, AT&T/MediaOne could, even after multiple ISPs interconnected to its network, continue to use the same traffic management and scaling tools that are in place today.

10. The only *additional* responsibility GTE's conditions would place on AT&T/MediaOne is the need to manage multiple connections between its cable modem network and ISPs. On this score, there is no question that GTE's Clearwater architecture is fully scalable. Numerous vendors, including Cisco and RedBack, currently offer ISP Subscriber Managers with enough ports to interconnect up to hundreds of ISPs. Should one Subscriber Manager not be large enough to handle all the ISPs that want to interconnect, additional boxes can be stacked on top of the first. Operation of these ISP Subscriber Managers does not create any additional difficulties for cable modem providers; management of multiple router connections is a common activity conducted by even some of the smallest ISPs.

11. Paragraph 5 of the Medin Declaration asserts that GTE's proposed open access conditions "could cause customer interference, network integration and network congestion problems, and prevent multicasting." But any network architecture could cause "customer interference" and "network congestion" problems if it is not designed, managed, and maintained properly. As explained above, GTE's open access conditions do not affect the network

management requirements cable modem providers face. And as explained above, the vast majority of all networks -- including Excite@Home's -- do not currently support multicasting. The question this proceeding presents is whether consumers would benefit *more* if such standards were set by AT&T/MediaOne alone (and implemented in closed and proprietary fashion) or by a cooperative process that will generate open standards.

12. Paragraph 6 of the Medin Declaration criticizes the Clearwater demonstration for its use of a "tunneling" solution to deliver packets to a customer's chosen ISP. (Simply put, "tunneling" adds a wrapper to each packet that identifies for the cable network's internal routers the ISP to which the packet should be sent.) GTE's Clearwater demonstration used two network protocols to implement its tunneling solution -- PPPoE and L2TP. The Medin Declaration criticizes both of these standards for not being "full Internet Engineering Task Force standards." *Id.* ¶ 6. This statement is disingenuous, both because these protocols are widely accepted and used, and because the standard that governs Excite@Home's network is far less open. Cable providers themselves turned away from IEEE 802.14 -- an open standard body -- that was in the process of developing an open standard for cable modems. Instead, they chose to work with Cable Labs -- a closed organization from which GTE's MSO has been excluded -- to create the proprietary DOCSIS protocol. L2TP, on the other hand, is currently going through the IETF standards-approval process and is on the verge of becoming an IETF-approved standard. Likewise, PPPoE enjoys wide acceptance in the consumer broadband access industry and a multitude of vendors offer products that support it.

13. Paragraph 6 of the Medin Declaration also asserts that “few of the existing DOCSIS deployed systems support” PPPoE’s “layer 2 bridging function,” despite the fact that Medin has stated to the Commission staff that roughly 30 percent of Excite@Home’s CMTS networks rely on layer 2 bridging. Paragraph 6 further claims that Cisco and 3.com do not offer products that support PPPoE, but neglects to mention that these equipment manufacturers do offer products that support L2TP. Paragraph 7 of the Medin Declaration criticizes GTE’s use of L2TP, asserting that the L2TP standard “greatly complicates the ability for cable operators to manage Quality of Service capabilities in the network.” The very same paragraph then goes on to identify the solution -- a change to the “DOCSIS standard to allow it to understand the L2TP approach.” Thus, Medin has again put the Commission to the choice of sanctioning a closed standard-setting process controlled by AT&T/MediaOne that thwarts consumer choice, or an open standard-setting process that will maximize innovation and consumer welfare.

14. Paragraph 8 of the Medin Declaration argues that GTE’s proposed open access conditions would require “the installation of special third party software.” But ISPs, not the cable provider, would supply this software to consumers, who would themselves be responsible for its installation. Roughly 18 million AOL customers have managed to accomplish this task, as have customers of almost every other dial-up ISP. Many ISPs already offer software that relies on PPPoE (to support ADSL customers, for example), and Windows 2000 has incorporated L2TP into its protocol stack.

15. Paragraph 9 of the Medin Declaration asserts that my opening submission incorrectly “implied that all devices” on a cable modem network “sit on the same LAN.” I

did not introduce this complication into my description of cable modem network architecture because it is absolutely irrelevant to workability of GTE's proposed open access conditions. It is true that some CMTSs cannot support multiple networks and "talk to each other . . . as on a typical LAN architecture." *Id.* But this in no way changes the architectural rules governing each CMTS network or the way that traffic from these networks is aggregated. The Medin Declaration fails to explain the technical significance of this point, making this paragraph one of many whose only purpose is to muddy the waters with confusing and irrelevant technospeak.

16. Paragraph 10 of the Medin Declaration argues that one Excite@Home "Regional Data Center may serve multiple cable systems" and that this architecture allows Excite@ Home to "deliver better economies of scale and therefore lower costs to consumers." Again, the Medin Declaration makes no effort to explain the significance of this point. GTE's proposed open access conditions in no way preclude Excite@Home from continuing to employ this network design. So long as competing ISPs are afforded access to cable modem networks at the same aggregation point as Excite@Home, GTE's condition of nondiscriminatory interconnection is satisfied. Moreover, Medin's assertion that this network design allows Excite@Home to achieve better economies of scale and lower consumer costs does not address a key question: *Better than what alternative design?* An open network will spur ISP competition and innovation in a way that will reduce "costs to consumers" far more than the closed, static network Excite@Home is locking into place. Medin does not take these benefits into account, meaning that even if GTE's proposed conditions require Excite@Home to move its aggregation points, consumers would nevertheless see substantial net benefits.

17. Paragraphs 11 and 12 of the Medin Declaration assert that my opening Declaration failed to appreciate the difficulty of aggregating traffic and affording multiple ISPs access to a cable modem network “at the regional data center.” Specifically, these paragraphs contend that “Excite@Home is fully integrated such that its equipment is located at almost every headend” and that a “properly implemented multiple ISP access solution would need to require ISP collocation at each headend.” Not surprisingly, the Medin Declaration suggests that such a solution would be prohibitively expensive. These paragraphs *prove* an absolutely critical point: Excite@Home is building its network in such a way as to increase dramatically the costs of implementing open access. It is indeed prohibitively expensive to require “ISP collocation at each headend,” which is why GTE’s proposed implementation allows ISPs to interconnect at a much higher level in the network. The Medin Declaration *already* complains that this solution “could potentially strand significant assets,” *id.* ¶ 12 -- a problem that will be magnified a thousand-fold if AT&T/MediaOne is able to complete its network upgrades based on a closed architecture.

18. Paragraphs 13, 14, and 17 of the Medin Declaration again raise a number of obtusely worded technical objections that have no significance. Paragraph 13 asserts that in an open access world, MSOs, rather than Excite@Home, would have to provide “OSS functions.” Likewise, paragraphs 14 and 17 argue that in an open network, MSOs, rather than Excite@Home, would have to operate DHCP servers and configure CMTSSs. These objections erroneously assume that cable providers are not capable of performing these tasks. Indeed, cable providers already have elaborate operations support systems in place to provision other product

offerings and many MSOs (including GTE) manage their own cable modem networks. Moreover, these objections falsely assume that GTE's proposed open access conditions would bar MSOs from outsourcing network management functions. GTE's proposed conditions do no such thing.

19. Paragraphs 15 and 16 of the Medin Declaration assert that -- because cable modem networks are a shared-bandwidth medium -- coordination between ISPs and the cable provider is necessary to keep "one ill-behaved modem or user" from "adversely impact[ing] all users on that portion of the cable plant." *Id.* ¶ 15. But problems with "ill-behaved" users and controlling "upstream bandwidth" exist even in a closed system, and the Medin Declaration makes no effort to explain how GTE's proposed open access conditions would undermine existing solutions addressed to these problems. Instead, Medin contradicts himself by attributing "DHCP services . . . and other network related functions" to ISPs, even though just one paragraph before he argues that MSOs would perform these functions in an open system. To the extent that these functions are taken over by the MSO or outsourced to one network management provider, no coordination would be required to assure that they run smoothly.

20. Paragraph 18 of the Medin Declaration claims that AT&T/MediaOne would not have "the ability to control the development of proprietary network and software protocols." To support this claim, Medin cites a number of industry standards that developed openly and notes that Internet content and applications are currently "written to existing open, compatible standards used industry-wide." These statements -- rather than demonstrating that AT&T/MediaOne could not develop closed proprietary network protocols -- highlight the

tremendous costs consumers would feel if the merged company is permitted to keep its network closed. Open standards are responsible for the Internet's extraordinary growth and for the innovation that has driven this growth. Excite@Home is *already* trying to undermine this open system by pressuring equipment manufacturers to make proprietary changes to cable modems, CMTSs, and set-top boxes that will support only Excite@Home's closed network design. Post-merger, the combined company's ability to demand these proprietary changes will be near-absolute because no voice will be heard speaking against AT&T/MediaOne's.

21. Paragraphs 19 and 20 of the Medin Declaration describe Excite@Home's caching process, explaining that outside content providers "control whether, and to what extent, their content will be cached by Excite@Home." *Id.* ¶ 20. But this description of Excite@Home's *current* caching procedures says nothing about what AT&T/MediaOne will do post-merger. Paragraph 21 of the Medin Declaration concedes that "Excite@Home does cache the content developed by firms with whom it has an affiliation agreement," confirming that on-net content is placed as close to customers as possible. While Excite@Home may not have an incentive *today* to deny the same treatment to outside content, it will have such an incentive once it adds Road Runner's customers to its own. This outcome need not be the result of some nefarious anticompetitive plan. AT&T/MediaOne's self-interest will dictate that it provide the best treatment to its own content because that content *alone* will be a source of revenue for the combined company.

22. Paragraph 22 of the Medin Declaration attempts to defend Excite@Home's 10-minute limitation on streaming video, asserting that such traffic causes "congestion on the

Internet” and the limitation allows “Excite@Home and its cable partners to manage bandwidth use.” This assertion is belied by the fact that Excite@Home currently does not enforce this limitation and has not had any publicized network management or congestion problems. Indeed, congestion problems can readily be solved by limiting the amount of bandwidth allocated to each customer, a feature supported by DOCSIS-compliant cable modems. Excite@Home’s streaming video limitation -- which undoubtedly will be enforced along with a host of others once AT&T and MediaOne shepherd their merger past the scrutiny of regulators -- can therefore only be understood as a means of defending cable television revenues from broadband competition.

23. Paragraphs 23 and 24 of the Medin Declaration confirm that Excite@Home’s routers can readily be set up to block customer access to outside content. Medin attempts to deflect attention from this fact by identifying legitimate uses for such capabilities, but the fact that a product can be used for good does not mean that it cannot also be used for evil. A combined AT&T/MediaOne will unquestionably have the *ability* to discriminate given the technology underlying its network. AT&T/MediaOne’s *incentive* to discriminate will come from its unrivaled customer base and revenues generated by keeping customers from going off-net.

24. The Medin Declaration’s list of supposed technical difficulties with open access -- offered in Paragraphs 25- 28 -- is merely a rehash of issues already addressed above. Paragraph 26 asserts that it is not possible “to allocate bandwidth to a ‘pool’ of unaffiliated ISP customers,” but GTE’s proposed open access conditions require no such allocation. Rather, cable providers can offer customers access capped at different speeds, just as DSL providers do today. Paragraphs 27 and 28 claim that cable providers are not capable of performing OSS and network


management functions, despite the fact that many cable providers already perform these tasks and that GTE's proposed open access conditions do not prohibit cable providers from outsourcing these functions.

25. Medin's sole new contention comes in Paragraph 29, where he claims that "network support cannot easily be managed on a system-by-system basis" and open access "would place inconsistent demands on each cable system, which would differ from community to community." The implication of this assertion is staggering. Plain and simple, AT&T/MediaOne is proposing a closed, monolithic network that spans the country, relying on uniform policies, uniform network and customer equipment, and a uniform architectural design. This structure runs counter to *everything* that has made the Internet what it is today -- open standards, a free and competitive market in customer equipment, and differing innovative architectural designs. The merged company will have a strong incentive to make this closed vision a reality, as standardization helps a single firm manage costs. Thus, private companies (and even government agencies) typically require all employees to use the same type of workstation and software, and follow the same Internet usage policies.

26. In the same way, AT&T/MediaOne will offer consumers a cookie-cutter product that provides the absolute minimum number of possible system configurations. This strategy will allow AT&T/MediaOne to concentrate its purchasing power with equipment vendors, making the implementation of closed and proprietary protocols all the more simple. In the end, the Internet will devolve from an open network that encourages innovation and maximizes

consumer choice to a closed system resembling the monopoly telephone network that AT&T assembled once before.

I declare under penalty of perjury that the foregoing is true and correct. Executed on
October 27, 1999.

A handwritten signature in cursive script, appearing to read "Albert Parisian", is written over a horizontal line.

Albert Parisian

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**EX PARTE REPLY DECLARATION OF DALE E. VEENEMAN
AND EVERTT H. WILLIAMS**

1. My name is Dale E. Veeneman. I am the Principal Investigator for the Digital Subscriber Line Network Infrastructure Project conducted by the Wireline Access Technologies Department of GTE Laboratories Incorporated. My responsibilities at GTE Labs and qualifications for submitting this Reply Declaration are detailed in my opening Declaration submitted to the Commission on August 23, 1999.

2. My name is Evertt H. Williams, and I am the Vice President of National Data Market Management for GTE Service Corporation. My responsibilities at GTE Service Corporation and qualifications for submitting this Reply Declaration are likewise detailed in my opening Declaration submitted to the Commission on August 23, 1999.

3. We have been asked to review the claims made by AT&T and MediaOne in their Reply Comments submitted to the Commission on September 17, 1999, concerning the

technological and economic limitations on the competitive performance of DSL. In particular, we have been asked to review the Declaration of Kenneth A. Shulman ("Shulman Declaration"), which is attached as Appendix J to AT&T/MediaOne's Reply Comments, and to respond to his observations on our opening Declaration.

4. The main premise of the Shulman Declaration is that "current technological advancements" will solve any and all limitations on DSL deployment and that, as a result, "there are no technological impediments that prevent DSL services from being deployed on a scale comparable to, or even more widespread than, cable modem services." Shulman Declaration ¶¶ 5-6. Based on this assertion, the Shulman Declaration credits the expectations of certain analysts that "90 to 95 percent of American homes will be DSL capable within the next five years." *Id.* ¶ 6. This conclusion is false and -- even if true -- irrelevant. The limitations we identified in our opening Declaration on the scope of DSL deployment -- a maximum range of 18,000 feet; the presence of bridged taps and loading coils on customer lines; and the costs associated with upgrading existing Digital Loop Carriers (DLCs) to support DSL -- are well recognized by carriers and industry analysts alike. Indeed, the Commission's Cable Services Bureau in its recent *Broadband Today* report itself recognized that "DSL is currently limited to locations within a three-mile maximum loop from the central office."¹ Moreover, even if DSL will be able to reach 90 to 95 percent of American homes within five years, the majority of that deployment will take place in the latter years. AT&T/MediaOne's own sources confirm that this

¹ Cable Services Bureau, *Broadband Today*, at 20 (Oct. 1999).

is the case.² Prior to that time, cable modems will maintain a significant head-start in the broadband access market, giving AT&T/MediaOne as the dominant provider an ample window of opportunity to consolidate its position of market power.

5. AT&T/MediaOne opens its discussion of DSL deployment by asserting that “the only real limitation on DSL technology is the unwillingness of ILECs to make the necessary investments.” Reply at 80. The Shulman Declaration amplifies these statements by highlighting certain disadvantages of cable modem service, including the need to “upgrade entire neighborhoods at a time to provide cable modem services to any single customer,” the fact that some customers may “prefer DSL services for fear that the shared cable spectrum might compromise the[ir] privacy,” and the fact that cable bandwidth (because it is shared) “could become congested during periods of peak use.” Shulman Declaration ¶¶ 12-13. Despite these drawbacks, AT&T/MediaOne asserts, cable providers have continued to invest in cable modems; ILECs and other DSL providers should therefore be willing to invest the same amount of capital.

6. These arguments fundamentally misconceive the calculus that GTE must consider when deciding which markets to target with DSL service. GTE has never argued that DSL is an inferior technology to cable modems, but only that there are many locations where the service cannot economically be rolled out. When making this evaluation, GTE must weigh the potential revenue stream that will be generated by offering high-speed access and compare that stream to the cost of capital required to deploy the service. Only if the present value of the investment is

² See Reply Comments at 82 n.244 (“[B]y year-end 2004, upwards of 90% of American households will be DSL capable.”).

positive and more favorable than other investments GTE could make with its limited resources (expanding its Internet backbone network, for example), will the company build out DSL service in a particular market.

7. AT&T/MediaOne's observation that "DSL was devised in 1987, and its viability was tested 'throughout the early 90s,'" Reply at 13, is therefore not meaningful. Until recently, there has not been enough demand for residential high-speed access to justify the significant investment required to deploy and mass-market DSL. (The failure of ISDN service to gain market share and create any significant revenues for GTE is instructive on this point.) This lack of demand -- not fear of cannibalizing T-1 sales -- is the reason why GTE did not commence its DSL deployment until 1998. Indeed, AT&T/MediaOne's assertion that GTE and other ILECs slow-rolled DSL deployment to protect their T-1 revenues is flatly inconsistent with marketplace reality. Not until the end of 1997 did DSLAM equipment become commercially available at a price that would permit an economical DSL roll out. Until that time, no major carrier -- including CLECs and IXC's -- launched a full-scale DSL deployment. Moreover, T-1 service differs fundamentally from the DSL service *any company* currently markets to consumers. First and foremost, T-1 service is not marketed to or purchased by residential customers, meaning that even the most comprehensive residential DSL roll out would not affect T-1 revenues. T-1 service is also a *symmetrical* 1.5 Mbps service that comes with a guaranteed level of performance. ADSL, on the other hand, offers customers far slower upstream speeds and does not come with any speed guarantees -- making it an unsuitable substitute even for a large subset of business customers.

8. Cable providers face a fundamentally different calculus when deciding whether to upgrade their networks to provide cable modem service. Cable plant upgrades that enable an MSO to offer cable modem services support at least *three* distinct lines of revenue. *First*, cable providers secure customer revenues through the sale of broadband access -- the revenue stream GTE earns with DSL. *Second*, cable providers are able to earn revenues from the sale of broadband ISP services, advertising, and e-commerce. Because cable providers are not required (as is GTE) to afford competing ISPs access to its customers, the revenues created by this offering are greater for cable providers. *Third*, cable upgrades that support cable modem service also support entirely new and separate product offerings, including interactive television and cable telephony. With more streams of revenue supporting network upgrades, cable providers can expect a much greater return on their investment than DSL providers. It is therefore a non-sequitur for AT&T/MediaOne to assert that, because cable providers have invested “tens of billions of dollars” in cable upgrades,³ DSL providers are “unwilling[] . . . to make the necessary investments” if they do not spend the same amount.⁴

9. Because AT&T/MediaOne misconceive this critical point, the Shulman Declaration is largely addressed to the wrong question. Although the Shulman Declaration identifies possible technical solutions to many of the limitations on DSL deployment noted in our original Declaration, it never speaks to the question of whether these solutions are cost-

³ Declaration of Janusz A. Ordover & Robert D. Willig, Attached as Appendix A to AT&T/MediaOne’s Reply Comments, at ¶ 17 (Sept. 17, 1999).

⁴ Reply at 80.

effective or whether their implementation would so dilute GTE's margins as to render investment in DSL too risky.

10. A prime example of this failing is the Shulman Declaration's discussion of alternative technologies that allow DSL service to reach beyond 18,000 feet from a central office. Under typical conditions, DSL cannot be provided at commercially viable quality over loops exceeding 18,000 feet. The only way to skirt this limitation is to use a different transmission technology altogether, or use repeaters to amplify the signal. All of the solutions identified in the Shulman Declaration rely on one of these two uneconomical and unproven options. The Shulman Declaration touts a GoDigital/Copper Mountain product that "would extend data and voice-over-IDSLS services to almost 100,000 feet (almost 17 miles) from the central office." *Id.* ¶ 15. Interestingly, Shulman never identifies what "IDSLS" is or explains how it differs from traditional ADSL. IDSLS is not a new product; rather, it is an ISDN product that relies on repeaters to extend the service range. This service is far more expensive to deploy than traditional ADSL, and far more expensive for consumers to purchase because it can only be provided over an additional telephone line. IDSLS service therefore lacks the main virtue of ADSL -- that customers can get high-speed data and telephone services over one pre-installed telephone line. To make matters worse, the maximum speed of IDSLS is 144 kbps -- only a small improvement over a typical 56 kbps modem and a far cry from the speed offered by cable modem service. Given these drawbacks -- none of which the Shulman Declaration or AT&T/MediaOne's comments see fit to mention -- GTE cannot deploy repeatered IDSLS service with any reasonable hope of recovering its investment.

11. Likewise, the GlobeSpan and Elastic Networks solutions cited in the Shulman Declaration are non-standard technologies whose marketing claims have not been commercially verified. *Id.* Generally, these technologies have been able to achieve a longer reach only by running their tests over a heavier gauge wire than GTE's standard copper loops, or by transmitting data over non-standard DSL frequencies that would interfere with telephone service.

12. As we explained in our opening Declaration, a significant percentage of GTE's customers therefore cannot be reached by DSL service. This fact is particularly significant because more affluent suburban homes are among the likely early adopters of broadband service, and many of these potential customers are beyond the reach of GTE and other DSL providers. The Shulman Declaration faults our estimate that only 65 percent of GTE's customers reside within 18,000 feet of a central office, citing a GTE public statement that puts the figure at 75 percent. *Id.* ¶ 7. Although both of these numbers are rough estimates, we believe ours is more accurate because roughly 75 percent of *all* telephone lines in the nation are more than 18,000 feet from a central office, and GTE's customer base is more suburban and rural than any other large LEC. In any event, even if the number is 75 percent, GTE remains unable to tap a large segment of the broadband market that cable providers can reach readily.

13. Over and above this large group of consumers, GTE and other DSL providers face serious obstacles offering DSL service to customers whose lines are equipped with bridged taps and loading coils. As we explained in our opening Declaration, 15 to 20 percent of all lines have loading coils that completely disrupt the provision of DSL service; likewise, an additional five percent of lines have bridged taps that render DSL service inoperable. The Shulman Declaration

offers no real explanation as to why these widely recognized impediments do not keep GTE and other DSL providers from reaching affected customers. Shulman correctly states that GTE has a line testing system that allows it to *identify* lines that fail to qualify for DSL service, *id.* ¶ 23, but says nothing about whether identified line defects can be removed at a cost that does not render the service unprofitable. Indeed, the Shulman Declaration confirms the severity of this problem when it states that some ILECs “currently impose[] a \$900 per-line non-recurring loop conditioning fee on customers that could include functions such as the removal of load coils, bridge taps, and/or repeaters.” *Id.* ¶ 25. Given the expense associated with loop conditioning -- and the fact that customers can get cable modem service without having to pay an up front fee approaching \$1,000 -- DSL service cannot viably be offered to this *second* large subgroup of customers.

14. Moreover, it is currently not profitable for GTE to serve customers whose loops are provisioned through existing DLCs, or to build new DLCs just to provide DSL service to residential customers. This *economic* impediment may not last forever. As the Shulman Declaration correctly notes, there “is no *technical* reason why incumbent LECs cannot increase the availability of xDSL services by collocating DSLAMs at the DLC sites, or by upgrading existing DLCs to incorporate DSLAM functionality.” *Id.* ¶ 19. Indeed, as Shulman again correctly states, “GTE is currently working with vendors to develop DSLAMs that can be installed in a DLC to expand availability to customers served by DLCs.” *Id.* ¶ 10. Nevertheless, serving existing neighborhoods through new or existing DLCs remains prohibitively expensive.

15. The Shulman Declaration identifies a number of new technologies that incorporate “both DLC and DSLAM functionality that can be housed in a remote terminal, taking up one-third to one-sixth the space needed to accommodate older DLCs.” *Id.* ¶ 18. These solutions are effective when GTE is building out service to new neighborhood subdivisions because this new equipment can be installed in DLCs when they are built. But that is not the problem we identified in our opening Declaration. A significant percentage of GTE’s *existing* customers are served by *existing* DLCs. These cabinets are full; there is no room to add DSLAM equipment without building a whole new cabinet, the cost of which would render the service unprofitable. The Shulman Declaration asserts that this conclusion is “disingenuous” because “the space requirements for modern DLCs and current/next generation DSLAMs are significantly smaller than last generation technology.” *Id.* ¶ 19. But that fact would only be relevant if GTE removed all of its DLC equipment and replaced it with next generation technology that incorporates DSLAM functionality. In other words, Shulman’s premise is that GTE should throw away its existing DLCs -- even though they work perfectly and represent (by current GTE estimates) a \$750 million dollar investment -- just to provide DSL service. Again, this suggestion ignores economic reality.

16. From GTE’s perspective, SBC’s recent announcement of “Project Pronto” -- a plan to provide DSL service to 80 percent of SBC customers by year-end 2002 -- does not change this economic calculus. GTE’s position has always been that its merger with Bell Atlantic will facilitate the more rapid deployment of advanced services -- a belief that finds strong support in SBC’s post-Ameritech merger announcement. On its own, GTE has just made

a multi-billion dollar investment in building a new Internet backbone network and is not in a position to make the \$6.1 billion gamble that SBC recently announced. After GTE's merger with Bell Atlantic is approved -- and the combined company has access to a much larger pool of resources -- its willingness to make more risky DSL investments may change. But in the meantime, even in SBC territories, cable providers will maintain a significant head start in deployment and customer acquisition.

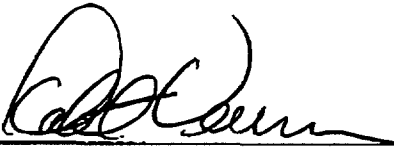
17. Finally, the Shulman Declaration points to the coming introduction of the G.lite Standard as a cure-all that will "reduce the . . . cost of deploying ADSL service significantly" and "likely increase the number of homes capable of receiving ADSL services." *Id.* ¶ 5. These statements are either misleading or untrue. G.lite is nothing more than an industry standard that will allow equipment vendors to build uniform DSL modems that are interoperable with all types of DSLAMs. While Shulman is correct that the introduction of G.lite will reduce DSL deployment expense by eliminating "truck roll costs," *id.*, that fact does not have any competitive significance. Cable modem providers will soon make the same stride with the introduction of the DOCSIS 1.1 standard, which will create uniformity among cable modems and allow computer manufacturers (or customers) to install cable modems directly into their PCs. Because cable modem providers are thus soon to see an identical reduction in deployment costs, the introduction of G.lite will not afford DSL providers any competitive advantage.

18. Moreover, the Shulman Declaration is simply incorrect when it states (without explanation) that the G.lite Standard "likely will increase the number of homes capable of receiving ADSL services." *Id.* The G.lite Standard is in no way addressed to the problems

created by bridged taps, loading coils, or DLCs noted above, and, if anything, exacerbates the difficulties associated with reaching distant customers. G.lite standardizes DSL modems by limiting the frequency range used to carry DSL signals, slowing the service that customers with short loops can get to the rate sustainable for customers with loops approaching 18,000 feet. In essence, the G.lite Standard caps the performance of every DSL modem at the least common denominator, even for customers served by shorter loops. G.lite weakens, not strengthens, the DSL signal and therefore does nothing to expand the geographic range of DSL service.

19. Ultimately, in the marketplace as it stands today, there are three large categories of customers that GTE cannot profitably offer DSL service. While GTE is actively addressing these issues, commercially viable solutions will not appear overnight. Cable modem providers -- and particularly AT&T/MediaOne as the would-be head of that group -- can therefore be expected to control a leading share of the broadband market for at least the next few years.

I declare under penalty of perjury that the foregoing is true and correct. Executed on
October 29, 1999.

A handwritten signature in black ink, appearing to read "Dale E. Veeneman", is written over a horizontal line.

Dale E. Veeneman

I declare under penalty of perjury that the foregoing is true and correct. Executed on
October 29, 1999.

A handwritten signature in cursive script, reading "Everett H. Williams". The signature is written in dark ink and is positioned above a horizontal line.

Everett H. Williams